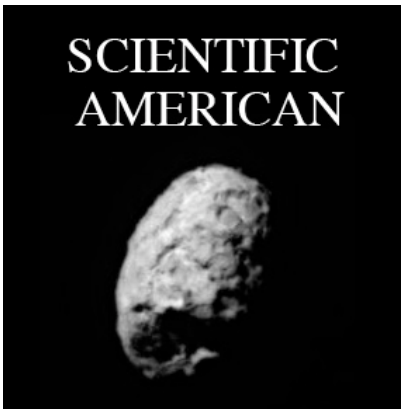
LAWRENCE LIVERMORE
REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Feb. 22 - March 1, 2010

Kooky Coki reveals marvels of comet contents



Comet Wild 2, as seen from the Stardust spacecraft as it closed in for a 2004 rendezvous.

When remnants from the comet Wild 2 from the NASA Stardust mission crashed to the Earth in 2006, scientists believed it would be a boon for learning more about the oldest, most primitive bodies in the solar system.

But new Laboratory analysis of those remnants paints a different picture. It shows that most of the material formed close to the sun and then migrated outward to be captured by the comet millions of years after the solar system began taking shape.

By analyzing a remnant named Coki, Laboratory geochemist Jennifer Matzel and her team found that the analysis reinforces the theory that comets originating in the Kuiper belt, the distant field of icy debris where Pluto orbits and beyond, contain fragments that formed somewhat later than the solar system's primordial grains, and much closer to the sun.

To read more, go to http://www.scientificamerican.com/article.cfm?id=wild-2-stardust-coki

Heading down the highway

Aerodynamic drag is caused from pressure differences around vehicles and Laboratory scientists are working to decrease that drag by developing and testing a series of devices that would cut down on the drag coming from semi-trucks.

At highway speeds, a semi-truck uses more than 50 percent of the energy produced by the vehicle engine to overcome aerodynamic drag, while rolling resistance consumes roughly 30 percent of the usable energy. The Laboratory devices already have proven that a semi-truck with aerodynamic devices on it can increase its fuel efficiency by 12 percent. A fleet of the nation's truck with devices on them could save the nation $10 billion in diesel fuel savings.

LLNL has partnered with Navistar and is now testing the devices in the world's largest wind tunnel at NASA Ames Research Center.

To see a slideshow of a media event held in mid-February, go to https://publicaffairs.llnl.gov/news/lab_report/movies/cnet-slides_truck_16feb2010.mov

A tall glass of water

Who would think that the water in a standard swimming pool could provide enough power to supply the state of California?

Laboratory scientists working at the National Ignition Facility certainly do, assuming all goes according to plan for scientists working on laser-driven fusion, NIF director Ed Moses, said recently at the annual meeting of the American Association of the Advancement of Science, AAAS

The sun's heat and light get generated in a fusion reaction, in which two hydrogen atoms combine to make helium. This reaction is driven by gravity, whereas in the proposed fusion reactor, particles come together because of lasers.

Water is the main and virtually limitless ingredient, since the idea is to make use of hydrogen particles in water. Later this year, researchers hope to test their technique with tritium, a radioactive isotope of hydrogen that has one proton and two neutrons.

To read more, go to http://scitech.blogs.cnn.com/2010/02/21/lasers-may-enable-fusion/?hpt=Sbin

Open for business

In an effort to encourage industry to make the East Bay the next Silicon Valley, Lawrence Livermore and Sandia national laboratories are working on a plan to make science and technology more accessible to businesses.

Lawrence Livermore and Sandia are moving forward on plans to build a campus where government scientists and outside researchers can work together on clean-energy technology.

Dubbed the Livermore Valley Open Campus, the project is set to rise on a roughly 110-acre parcel on the labs' sprawling property. The new facility is envisioned as a green-technology hub where scientists can apply defense-related capabilities to other endeavors, such as renewable energy and fuel-efficient vehicles. The initiative is expected to receive financing from both the federal government, which operates the labs, and the private sector.

To read more, go to http://online.wsj.com/article/SB10001424052748703315004575073701233356046.html?mod=googlenews_wsj

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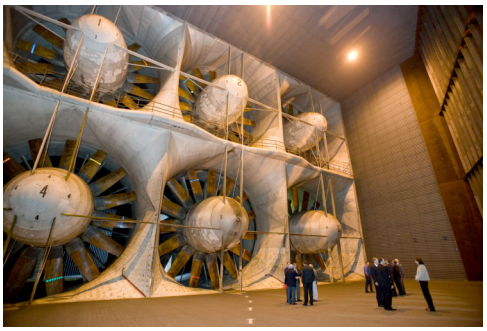
Photo of the week



BLOWING IN THE WIND: The giant wind turbines in the world's largest wind tunnel at NASA Ames can generate wind speeds at more than 100 mph.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

To send input to the Livermore Lab Report, send e-mail mailto:labreport@llnl.gov.

The *Livermore Lab Report* archive is available at:
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